

## ELECTROLUMINESCENT PANEL

The application is a Continuation of my patent application, serial No.10/153,678, filed on May 24, 2002.

### 5 BACKGROUND OF THE INVENTION

#### Field of the Invention:

[0001] The present invention relates to an electroluminescent panel, and more particularly to an electroluminescent panel comprising back electrode layer having letter or pattern formed thereon.

#### 10 Description of Related Art:

[0002] Electroluminescent panels are widely applied in making advertising sign boards, signal boards, ornamental panels for motor vehicles or buildings and the like because of its advantageous features of light weight and emitting light without  
15 heat. A general electroluminescent panel comprises a front electrode layer, a luminescent layer, a reflective layer, and a back electrode layer. In order to manufacture an electroluminescent panel for displaying desired letters, signs or pattern, the front electrode layer, the luminescent layer and the reflective layer are  
20 sequentially formed by performing a screen-printing process. Next, a screen plate having the desired letters, sign or pattern is used to print the desired letters, sign or pattern is placed onto the reflective layer, and then the back electrode layer is printed onto

the reflective layer. When a client orders a particular design of electroluminescent panels, the manufacturer has to prepare a particular set of screen plates. Therefore, the aforementioned process would be cost effective for mass production for customers  
5 who require large quantity of electroluminescent panels for displaying same letters, signs or pattern. Therefore, it is quite expensive for manufacturing electroluminescent panel with unique or personalised letters, signs or patterns as these unique letters, signs or patterns require specific set of screen plates.

## 10 SUMMARY OF THE INVENTION

[0003] It is therefore an object of the present invention to provide an electroluminescent panel having a particular design, which can be practically and economically manufactured. According to one aspect of the present invention, the desired letters, signs or  
15 patterns are formed in the back electrode layer of an electroluminescent panel. According to another aspect of the present invention, the electroluminescent panel having a plurality of contact holes is formed in an insulating layer according to the letters, signs or patterns.

## 20 BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIG. 1 is a sectional view of an electroluminescent panel constructed according to an embodiment of the present invention.

[0005] FIG. 2 is a flow chart illustrating a process of forming an

electroluminescent panel according to an embodiment of the present invention.

[0006] FIG. 3 is an exploded view of an electroluminescent panel according to an embodiment of the present invention.

5 [0007] FIG. 4 is a perspective view of an electroluminescent panel according to an embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0008] Referring to FIGS. 1, 2, and 3, an electroluminescent panel 1 is shown comprising a transparent layer 11, a front electrode layer 12, a luminescent layer 13, a reflective layer 14, and a back electrode layer 15. The front electrode layer 12, the luminescent layer 13, the reflective layer 14, and the back electrode layer 15 are sequentially formed on the transparent layer 11 by using a printing method. Next, the back electrode layer 15 is etched to form the desired letters, signs or patterns. Thus, the manufacture of the electroluminescent panel 1 is completed.

[0009] Subsequently, an insulating layer 2 is provided. Next, a plurality of contact holes 21 is formed by engraving in the insulating layer 2. Next, insulating layer 2 is adhered on one side of the back electrode layer 15. Next, a conductive layer 3 is adhered onto insulating layer 2 such that the conductive layer 3 is connected to the contact holes 21.

[0010] The aforementioned desired letters, signs or patterns can

be formed on the back electrode layer 15 by using, for example, a laser etching technique. Further, the intensity or energy of the laser beam can be controlled achieve desired etching depth to make the desired letters, signs or patterns in desired in the back electrode layer 15 and not damaging the electroluminescent panel 1.

[0011] Referring to FIGS. 3 and 4, the insulating layer 2 can be a layer of polymer film or plastic film. The contact holes 21 of the insulating layer 2 are disposed corresponding to the desired letters, signs or patterns in the back electrode layer 15 of the electroluminescent panel 1. The conductive layer 3 has lead legs 31 connected to the lead-out wires 51 of a power adapter 5. Therefore, the design of the back electrode layer 15 of the electroluminescent panel 1 is electrically connected to the power adapter 5 through the conductive layer 3 when the conductive layer 3 installed into the electroluminescent panel 1 and connected to the power adapter 5.

[0012] Alternatively, a plurality of conductive layers 3 may be adhered to the insulating layer 2 and connected to different parts of the design in the back electrode layer 15 of the electroluminescent panel 1, enabling the respective parts of the desired letters, signs or patterned in the back electrode layer 15 of the electroluminescent panel 1 to be illuminated one after another

or intermittently illuminated according to a predetermined illuminating mode. Furthermore, a thin insulating film 4 may be provided for covering the conductive layer 3 and the transparent layer 11 of the electroluminescent panel 1 to protect the  
5 conductive layer 3 and the transparent layer 11. The transparent layer 11 of the electroluminescent panel 1 may comprise a desired pattern printed thereon or a thin film having a variety of patterns and colors may be adhered onto the transparent layer 11 and then different or mixed colors (not shown) are provided.

10 [0013] The desired letters, signs or patterns in the back electrode layer 15 of the electroluminescent panel 1 can be formed by using a laser engraving machine, an etching machine, a cutting machine, or any machine tools capable of forming the desired pattern in the back electrode layer 15 of the electroluminescent panel 1. The  
15 aforesaid conductive layers 3 can be made of a flexible circuit board, aluminum foil, copper foil, silver paste, or conductor wires. The thin insulating film 4 can be made of a transparent or semi-transparent polymer or plastic film.

[0014] Accordingly, the present invention has at least the  
20 following advantages.

[0015] Because the desired letters, signs or patterns on the back electrode layer by laser etching technique, and therefore do not require specific set of printing screen, and therefore the

manufacturing the electroluminescent panel.

[0016] Because the desired letters, signs or patterns on the back electrode layer by laser etching technique, and therefore the processing time for forming the desired patterned can be  
5 effectively reduced. Therefore, the overall manufacturing cost can be reduced.

[0017] Although a particular embodiment of the invention has been described in detail for purposes of illustration, various modifications and enhancements may be made without departing  
10 from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.